Pleuraphis jamesii Shrub Herbaceous Alliance

MAP CLASS	Galleta Mixed Shrublands
COMMON NAME	Galleta Shrub Herbaceous Alliance
PHYSIOGNOMIC CLASS	Herbaceous Vegetation (V)
PHYSIOGNOMIC SUBCLASS	Perennial graminoid vegetation (V.A.)
PHYSIOGNOMIC GROUP	Temperate or subpolar grassland with a sparse shrub layer (V.A.7)
PHYSIOGNOMIC SUBGROUP	Natural/Semi-natural (V.A.7.N)
FORMATION	Medium-tall temperate or subpolar grassland with a sparse needle-leaved or microphyllous evergreen shrub layer (V.A.7.N.e)
ALLIANCE	*Pleuraphis jamesii* Shrub Herbaceous Alliance

CLASSIFICATION CONFIDENCE LEVEL Alliances are not ranked by NatureServe for classification confidence.

USFS WETLAND SYSTEM Upland

RANGE

Wupatki National Monument

Two associations were defined as part of the *Pleuraphis jamesii* Shrub Herbaceous Alliance. However, one field relevé did not have shrub species that correspond to a pre-existing association. This relevé was measured on the rim of White House Mesa.

Globally

This alliance is described from the upper Rio Puerco watershed in northwestern New Mexico and adjacent Arizona. It is likely that it occurs in other parts of the Colorado Plateau.

ENVIRONMENTAL DESCRIPTION

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Based on one relevé, this association was located in cinder gravel and limestone cobbles.

Globally

This alliance has been described from the southern Colorado Plateau in northwestern New Mexico and adjacent Arizona. The elevation ranges from 4,921-6,102 ft (1,500-1,860 m), but stands likely occur over a wider elevational and geographical range. Climate is semi-arid with most of the highly variable precipitation falling in July and August. The driest month is April. Mean annual precipitation ranges from 9-13 in (22-32 cm) within the Rio Puerco watershed. Sites occur on a variety of landforms including mesas, plains, alluvial flats and fans, floodplains, and hillslopes. Soils are shallow, poorly developed and alkaline. Soil textures range from fine sandy loam to silty clay loam to clay. The ground surface has high cover of bare ground (to 90%) with little litter or rock cover (Francis 1986). Additional survey and description work are needed to fully describe the environment of this alliance.

MOST ABUNDANT SPECIES

Wupatki National Monument

Stratum	Species
Shrub	*Ephedra viridis, Atriplex confertifolia*
Herbaceous	*Pleuraphis jamesii*

Globally

Stratum	Species
Herbaceous	*Pleuraphis jamesii*

ASSOCIATED SPECIES

Wupatki National Monument

Atriplex canescens, Bouteloua eriopoda, Hesperostipa comata, Juniperus monosperma, Lycium andersonii Muhlenbergia porteri, Sporobolus airoides

Globally
Sporobolus airoides, *Sporobolus cryptandrus, Achnatherum hymenoides, Elymus elymoides, Muhlenbergia torreyi, Schedonnardus paniculatus*, *Bouteloua gracilis, Sphaeralcea coccinea, Astragalus* spp., *Atriplex obovata, Gutierrezia sarothrae*, *Artemisia bigelovii, Atriplex canescens, Atriplex confertifolia, Ericameria nauseosa, Ephedra* spp., *Krascheninnikovia lanata, Opuntia* spp., *Yucca* spp.

VEGETATION DESCRIPTION
Wupatki National Monument
Galleta Shrub Herbaceous Alliance total vegetation cover was 28%, with 12% absolute cover in the shrub layer and 14% absolute cover the herbaceous layer. Within the one relevé sampled the total species diversity was 14.

Ephedra viridis is the dominant species in the shrub lifeform (6% absolute cover); *Atriplex confertifolia* has the second highest cover (2.5% absolute cover). The herbaceous layer is dominated by *Pleuraphis jamesii* (11% absolute cover). *Bouteloua eriopoda* (2% absolute cover) and *Sporobolus airoides* (3% absolute cover) are also common species in the herbaceous layer.

Globally
This alliance is found on mesas in northwestern New Mexico and adjacent Arizona. The vegetation is dominated by a sparse to moderately dense herbaceous layer of perennial grasses that is characterized by *Pleuraphis jamesii (= Hilaria jamesii)* with a open short-shrub canopy (10-25% cover). *Pleuraphis jamesii* typically grows as a bunchgrass, but under favorable conditions may produce a sod. It dominates the herbaceous layer growing in nearly pure stands or is codominated by *Sporobolus airoides* or *Sporobolus cryptandrus*. Other common perennial grasses such as *Achnatherum hymenoides (= Oryzopsis hymenoides), Elymus elymoides, Muhlenbergia torreyi, Schedonnardus paniculatus*, or *Bouteloua gracilis* may occur in small amounts (less than half the cover of *Pleuraphis jamesii*). Forb cover is sparse and typically includes *Sphaeralcea coccinea* and *Astragalus* spp. The open short-shrub layer is often dominated by *Atriplex obovata* or *Gutierrezia sarothrae*, but may include may other shrubs and dwarf-shrubs such as *Artemisia bigelovii, Atriplex canescens, Atriplex confertifolia, Ericameria nauseosa, Ephedra* spp., *Krascheninnikovia lanata, Opuntia* spp., or *Yucca* spp., with less than 25% total cover. Total vegetation cover ranges from 10-75% with graminoids making up 8-60% cover. The sparse stands described by Francis (1986) may indicate a seral/degraded state and need further review.

CONSERVATION RANK G2G4

DATABASE CODE A.1532

MAP CLASSES
Galleta Shrub Herbaceous Alliance is represented by the map class Galleta Mixed Shrublands (map code 14).

The total area mapped within Wupatki NM is 1,315 ac (532 ha) within 255 polygons and the total area in the park environs is 1,213 ac (491 ha) within 107 polygons.

COMMENTS
Wupatki National Monument
Two associations were defined as part of the *Pleuraphis jamesii* Shrub Herbaceous Alliance (*Gutierrezia sarothrae / Sporobolus airoides – Pleuraphis jamesii* Shrub Herbaceous Vegetation and *Ericameria nauseosa / Pleuraphis jamesii –* (*Hesperostipa comata*) Shrub Herbaceous Vegetation). The one field relevé described in this vegetation description represented a community composition that did not correlate to a pre-existing association. With only one relevé described of this type, we were unable to define a provisional association and described this community to a coarser community classification using a pre-existing alliance. This community type, if described elsewhere on the Colorado Plateau, may be classified into an association with additional field sampling.

Globally
The main difference between stands in this alliance and the *Pleuraphis jamesii* Herbaceous Alliance (A.1287) is the presence of a significant woody layer composed of shrubs and dwarf-shrubs. However, stands described by Francis (1986) have less than 10% total vegetation cover and may be better classified in a sparsely vegetated alliance. Further confusing this type, Francis (1986) includes degraded stands of the *Sporobolus airoides - Pleuraphis jamesii*

alluvial flats plant community in this mesa top plant community. Francis (1986) also described many other plant communities in the Upper Rio Puerco watershed, some of which may also fit the concept of this alliance. This alliance description is based on two plant community descriptions by Francis (1986) and work done at Petrified Forest National Monument. Some stands included in this alliance may form a transitional stage between *Pleuraphis jamesii - Sporobolus airoides* grasslands and *Atriplex obovata* dwarf-shrublands. Further study is needed, especially on the effects of livestock grazing on vegetation structure.

DYNAMICS
Grazing has significantly impacted much of the vegetation in this region, which has had a long history of settlement and heavy livestock use. With proper livestock management and time, palatable species such as *Krascheninnikovia lanata* and *Sporobolus airoides* may increase, and *Gutierrezia sarothrae* and *Opuntia* spp. may decline in abundance (Francis 1986).

REFERENCES
Francis 1986, West et al. 1972